

Important Dual Rinse Articles

Clinical safety

Safety assessment of an etidronate in a sodium hypochlorite solution: randomized double-blind trial. Ballal NV, Gandhi P, Shenoy PA, Shenoy Belle V, Bhat V, Rechenberg DK, Zehnder M. *Int Endod J*. 2019 Sep;52(9):1274-1282. doi: 10.1111/iej.13129. Epub 2019 May 13. PMID: 30993696

Chemical, cytotoxic and genotoxic analysis of etidronate in sodium hypochlorite solution. Ballal NV, Das S, Rao BSS, Zehnder M, Mohn D.

NaOCl compatibility

Compatibility of Dual Rinse 1-Hydroxyethane-1,1-Diphosphonic Acid with Sodium Hypochlorite Solutions Containing Proprietary Additives. Kottathil H, Zehnder M, Gubler A, Attin T, Narkedamalli R, Ballal NV. *J Endod*. 2024 Oct;50(10):1472-1477. doi: 10.1016/j.joen.2024.07.007. Epub 2024 Jul 20. PMID: 39033801

Root canal disinfection

Dual Rinse HEDP increases the surface tension of NaOCl but may increase its dentin disinfection efficacy. Giardino L, Del Fabbro M, Morra M, Pereira T, Bombarda de Andrade F, Savadori P, Generali L. *Odontology*. 2019 Oct;107(4):521-529. doi: 10.1007/s10266-019-00436-4. Epub 2019 Jun 13. PMID: 31197618

Enhancing the Intracanal Antibacterial Effects of Sodium Hypochlorite with Etidronic Acid or Citric Acid. Andrea F Campello¹, Renata C V Rodrigues², Flávio R F Alves³, Karla R Miranda⁴, Sileno C Brum¹, Ibrahim Mdala⁵, José F Siqueira Jr⁶, Isabela N Rôças. PMID: 35750221; DOI: 10.1016/j.joen.2022.06.006

Endotoxin Levels after Calcium Hydroxide Placement in Root Canals Irrigated with Continuous or Sequential Chelation in Previously Treated Teeth with Symptomatic Apical Periodontitis: A Randomized Controlled Clinical Trial. Pandya DS, Kritika S, Sanjeev K, Mahalaxmi S, Neelakantan P. *J Endod*. 2025 Aug 18:S0099-2399(25)00468-6. doi: 10.1016/j.joen.2025.08.004. Online ahead of print. PMID: 40835176

Instrumentation

Continuous Chelation Reduces Instrumentation Time and Straightening of Double-curved Simulated Root Canals in Bovine Dentin. Hofpeter K, Zehnder M, Solomonov M, Deari S. *J Endod*. 2025 Mar;51(3):367-372. doi: 10.1016/j.joen.2024.12.011. Epub 2024 Dec 20. PMID: 39710188

Impact of Reduced Irrigation and Preparation Time on the Shaping Efficiency of the New SAF Infinitum System in Long Oval Root Canals. Solomonov M, De-Deus G, Frota RRG, Silva EJNL, Belladonna FG, Ben-Itzhak J, Versiani MA. *J Endod*. 2025 Jun 6:S0099-2399(25)00320-6. doi: 10.1016/j.joen.2025.05.027. Online ahead of print. PMID: 40484227

Sealer adhesion

Effect of Novel All-in-One Root Canal Irrigants on Dislodgement Resistance of Epoxy Resin and Hydraulic Calcium Silicate Sealers: An Ex vivo Study. Kamath S, Narkedamalli R, Shetty KP, Ballal NV. *Eur J Dent*. 2025 Sep 4. doi: 10.1055/s-0045-1811574. Online ahead of print. PMID: 40907536

Effect of Sodium Hypochlorite Concentration in Continuous Chelation on Dislodgement Resistance of an Epoxy Resin and Hydraulic Calcium Silicate Sealer.

Ballal NV, Roy A, Zehnder M. *Polymers (Basel)*. 2021 Oct 11;13(20):3482. doi: 10.3390/polym13203482. PMID: 34685241